ATOMIC ENERGY Letter

THE FIRST AND ONLY [illegible] SERVICE

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November 3rd, 1953
Vol. 10...No. 8 7

Dear Sir:

The first full scale nuclear reactor to produce a minimum of 60,000-kilowatts of useable electrical energy will now be built by the U.S. Atomic Energy Commission, Thomas E. Murray, member, USAEC, said in Chicago last fortnight. Westinghouse Electric will be prime contractor on this undertaking, which will be located near one of the plants now producing uranium-235 by the gaseous diffusion process. (Page 2 this LETTER gives additional details this project.)

Simultaneous with this announcement (as above), which was made to a meeting of the Electric Companies Public Information Program, was the distribution of an atomic energy information kit to eighty-one members of this Information Program. This kit, which reflects the interest of utility companies in nuclear energy, was prepared for the PIP by Charles Robbins, now executive manager of the Atomic Industrial Forum, Inc. The kit gives facts on nuclear power in understandable, lay terms. It should be of value to electric utility management for customer contacts, employee publications, and stockholder reports.

Diamond Alkali Co., Cleveland, Ohio, has now joined the industrial study team of Foster-Wheeler Corp., New York, and Pioneer Service & Engineering Co., Chicago, in their investigation of the application of atomic power to electric power generation. Diamond Alkali becomes the chemical partner of the group. At the same time, Pittsburgh Piping and Equipment Co., Pittsburgh, became consultant to this group in the piping, metallurgy, and fabrication field. The team has just submitted its first report to the USAEC, and has been granted an additional period of six months in which to continue its studies. The newly-constituted group will continue activities already under way.

The second atomic weapon was detonated last week by a British group in the current series of tests which have been conducted by Britain at the Woomera rocket range, in Australia. In a manner similar to the first test of the current series, this second detonation was made from a tower.

The question of whether the United States has not now reached the point of diminishing returns in production of fissionable materials for military use was raised by Senator Ralph E. Flanders, of Vermont. Senator Flanders spoke before the American Standards Association, in New York last week. He observed that if the government has sufficient fissionable material, it should turn its attention to the civilian uses of atomic energy. He noted that the United States had spent nearly $10 billion on the atomic energy program, and that if the bomb is "one-tenth as good as we are told it is it should stop an enemy. If we haven't enough to stop an enemy, what's wrong with us? Ten times as much fissionable material as is required will not be ten times as effective in defending the nation."

New uranium ore tonnage indicated by drilling on the south of the main orebody of Gunnar Gold Mines' uranium deposit on Lake Athabaska, in Canada, has increased optimism concerning the future of this Canadian mine.

Subscription rates: United States, U.S. possessions, and Canada, $18.00 a year. Latin America, $20.00 a year. All other countries, $25.00 a year.

FAR MORE IMPORTANT THAN WAR: Special excerpts from address of that title by Thomas E. Murray, USAEC Commissioner, before meeting of Electric Companies Public Information Program, Chicago, Ill., October 22, 1953.

Until recently defense demands have limited large scale nuclear power efforts primarily to military propulsion projects, such as submarine reactors. But the world situation, as well as the evolving progress of reactor technology now call for a great change of pace. With this in mind, the USAEC has decided that it is time for full-scale construction.

But before making this decision, we had to answer a fundamental question--would private industry, if permitted by law, enter aggressively into the full-scale power reactor construction and testing stage. The answer of competent, interested industrialists is no.

Therefore the USAEC has embarked on a program to construct a full-scale power reactor. It will produce a minimum of 60,000-kilowatts of electrical energy with good possibilities of much higher output.

There has been much talk and perhaps guarded criticism among some scientists and some industrial groups of the choice of the particular reactor design that we have selected for our first large scale reactor. The design was not selected at random, but is one of several studied for some time and approved by the entire reactor fraternity--and in addition, this particular reactor was much farther along than any of the alternate systems.

We are considering the possibility of locating this first reactor at or near one of our gaseous diffusion plants. If this is done, the unit would supply some small fraction of the power requirements for such a plant.

Because of Westinghouse Electric's previous experience with the reactor system chosen, they have been picked by the USAEC as principal contractor for the development of this first power reactor. Private enterprise, and private capital, are invited to participate. The USAEC will welcome offers from industry to invest risk capital in the building of the steam and turbine portions, as well as in the operation of the entire plant.

Supervision of the project has been delegated to the USAEC's reactor development division, The director of this division, Dr. Lawrence R. Hafstad, has assigned the immediate responsibility for the job to Rear Admiral Hyman G. Rickover, the Navy reactor expert. This choice was based on Admiral Rickover's unique experience and accomplishments in building propulsion power reactors for the USAEC and for the Navy.

Here is what the USAEC told the Joint Congressional Committee concerning this new power reactor:

> "Although the Appropriation Act contains a general authorization to the USAEC to build a reactor that will advance joint civilian central station power technology, and naval propulsion technology, you may rest assured that this reactor will be as you described it--a completely civilian version. No compromise or hybridization is planned or needed."

This first full scale reactor will not, by any means, be the exclusive and sole effort of the USAEC in the nuclear power field. In the immediate future we expect to propose the construction of different types of reactors that will explore promising avenues of approach to practical nuclear power.

This is because the United States nuclear power policy is now calling for early development of practical power reactors.

And in this connection I am convinced that the time has come to end the monopoly of power reactor information now shared between the U.S. Government and a few industrial concerns in order to permit much wider participation under appropriate security controls.

But a word of caution is in order. There has been an illusion that the present government monopoly is the only substantial block in the road to competitive nuclear power. Any expectation that simply changing the law will solve technological problems is a very grave mistake. Don't underestimate the immensity of the research and engineering job still to be done. Its very difficulty is one of the reasons why the USAEC is calling on privately financed industry for help.

SPECIAL REPORT: Second Annual Conference on Atomic Energy, held by National Industrial Conference Board, New York, Oct. 29-30, 1953.

Views of industrial and Government executives, on atomic energy in the United States, were expressed at this conference, held last week in New York.

W. E. Kingston, atomic energy division, Sylvania Electric Products, told the conference that he believed nuclear technology will advance to the point where small nuclear engines can be developed, giving ample power to drive trains and trucks. He said he felt confident that within the next two or three generations this would become a reality.

Along these same lines, Representative W. Sterling Cole, chairman, Joint Congressional Committee on Atomic Energy, said that floating, mobile atomic power plants offer a very real and profitable opportunity for private investment, as against large central power stations which are not an attractive proposition to private investors. He noted that at Thule Air Force Base, in Greenland, diesel generators produce electricity at a cost of 4-cents per kilowatt hour. This contrasts, he observed, with the ½-cent kilowatt hour cost in New York City. This is an instance, he pointed out, where small "packaged" nuclear power plants might be economic. He asked whether there is any reason why a private atomic power industry should not compete to develop and manufacture units for this application (and for use in other remote areas for defense purposes).

Phillip N. Powers, executive administrator of Monsanto Chemical Co.'s nuclear power project, told the conference that it is necessary for the Government to permit the nuclear reactor field to be opened to private industry. Then, he said, industrial engineers, working on reactor problems and being paid by industry, will undoubtedly strengthen this country's over-all position in the reactor field.

Walker L. Cisler, president, Detroit Edison Co., spoke for amending the Atomic Energy Act to permit private industry to build, own and operate nuclear energy power plants and to be allowed other powers and rights, now denied by the Act. George L. Gadsby, president, Utah Power and Light Co., asked that the place of the utility companies (in the nuclear program) should be recognized to the fullest degree consistent with the preservation of national security.

Eugene M. Zuckert, member of the USAEC, said that the more nearly the atomic energy industry can resemble normal industry, the more people will be interested in pushing forward atomic energy. He asked for assurances of stability that will permit atomic energy to compete on a normal basis for capital. We believe, he said, that legislation is necessary to create the atmosphere in which people will be able to spend their own money.

Other congressional views were given by Representative Chet Holifield, member of the Joint Committee. He contrasted the present situation with the one which prevailed prior to the hearings on nuclear power held by the Joint Committee last June and July. Before these hearings were held, he observed, there were speeches and articles calling for radical changes in the Atomic Energy Act, and forecasting that if these changes were made, that industry would pick up where the USAEC left off. But, he said, after 12 very thorough discussions with industrial study groups, the Joint Committee was unable to find any sound basis for the proposition that American industry was willing to develop atomic energy without Government subsidies.

IONIZING RADIATION & RADIOISOTOPES...news and notes...

A series of tests have now been made at Columbia University, New York, in an effort to determine whether gamma ray sterilization of food products might destroy vitamin values. In the test, each product was exposed to cobalt-60, under the direction of E. L. Gaden and E.J. Henley. Irradiation periods were one, three, six or twelve hours. Then the samples were analyzed for vitamin A by H. C. King. It was found that after six hours, butter had lost 68% of its Vitamin A; cream cheese 54%; cheddar cheese 47%; and oleomargarine 14%. (To sterilize these samples requires 20-hours of irradiation at this same rate.) Of interest is that the vitamin A in butter is destroyed more easily than in oleomargarine; after twelve hours of irradiation, with radiocobalt, butter loses 78% of its vitamin A, compared with a 28% loss for the oleomargarine.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...in the nuclear field...

FROM THE MANUFACTURERS: New personnel safety radiation alarm, trade-named R-VOX, gives an audible alarm signal in the presence of an excessive amount of radiation. Instrument weighs nine ounces, and is compact in size; may be belt-carried (by means of a belt loop) or may be used as an area monitor. Standard range of the instrument is 100-milliroentgens. The R-VOX is automaticaly in operation when turned face-up or to a vertical position. Exposure and/or instrument operation may be checked at any time during use without loss of accumulated dose. Chambers, for the instrument, up to 25-roentgens, are available. For maintenance, the penlight cell which supplies filament current may be replaced by removing a bayonet plug. -- Radiation Counter Laboratories, Inc., Skokie, Ill.

NOTES: This year's Conference on Electronics & Nucleonics in Medicine (sixth annual) will be a joint effort of the American Institute of Electrical Engineers, Institute of Radio Engineers, and Instrument Society of America. The Conference will be held Nov. 19-20, 1953, in New York. The first session will deal with diagnostic devices; one paper will cover localization of brain tumors by positron-emitting isotopes. Another session will consist of papers on X-ray techniques, including isodose plotting techniques, brightness intensification, X-ray microscopy, and three dimensional X-ray moving picture techniques. Other sessions will cover blood measurements, and fields of current interest. Further information may be obtained from Mr. R. S. Gardner, 33 W. 39th St., New York 18.

ATOMIC PATENT DIGEST...news of U.S. patents in the nuclear field...

PATENTS: Additional patented inventions, developed in the course of U. S. Government-sponsored nuclear research, and Government-owned, are now available on a royalty-free (non-exclusive) basis. Inquiries concerning licenses for this group, as well as for those previously made so available, should be directed to Patent Branch, USAEC, Washington 25, D. C. This new group of U.S. Patents includes: (1) Production of isotopes by reaction of neutrons; No. 2,206,634. (Inventors: E. Fermi, E. Amaldi, F. Rasetti, E. Segre, B. Pontecorvo). (2) Improvements in radioactivity survey apparatus; No. 2,619,601. (Inventors: S.M. Zollers.) (3) Method and apparatus for determining frequency of frequency modulated signal; No. 2,647,998. (Inventor: G. D. Paxon.) (4) Bridge for resistance measurement; No. 2,649,571. (Inventor: R. J. Smith.) (5) Electrolytic unit for producing fluorine by electrolysis of fused metal hydrogen fluorides; No. 2,651,613. (Inventors: R.D. Fowler and W. B. Burdord, III.) (6) Mass spectrometer beam regulator; no. 2,651,725. (Inventor: W. R. Baker.) (7) Ionization chamber circuit; No. 2,651,726. (Inventors: G.K. Froman, W.H. Hinch, and R.J. Watts.) (8) Apparatus for measurement of resistance of electrolyte materials; No. 2,651,751. (Inventor: H.R. Heath.) (9) Apparatus for measuring level of liquid particularly useful when liquid is inaccessible; No. 2,651,940. (Inventor: K.H. Kline.) (10) Automatic tank pump down; No. 2,652,188. (Inventor: R.R. Cyr.) (11) Measurement of very high temperatures; No. 2,652,497. (Inventor: A.J. Miller.) (12) Gas discharge device, of the cold cathode gas filled type; No. 2,652,510. (Inventors: L.R. Landrey and A. Mazzei.) (13) Electromagnetic centrifugal pump for electrically conductive fluids; No. 2,652,778. (Inventor: F.E. Crever.) (14) Preparation of carrier-free radioactive phosphorous values; No. 2,653,076. (Inventor: W.E. Cohn.) (15) Method of forging metals; No. 2,653,494. (Inventor: E.C. Creutz.) (16) Pulse generator; No. 2,654,840. (Inventor: E.C. Wiegand.) (17) Vapor detector for sensing mercury vapor; No. 2,654,845. (Inventor: C.D. Presenz.) (18) Beam deflector; No. 2,654,851. (Inventor: D.T. Scalise.) (19) Electromagnetic fluid pump; No. 2,655,107. (Inventor: N.H. Godbold.) (20) Radiation detection and survey instrument; No. 2,656,476. (Inventor: R.H. Firminhac.) (21) Signal deviation warning system; No. 2,565,527. (Inventor: J.E. Tillman.)

TRADE-MARKS: Trade-mark registration number 611,332 has now been made in the U.S. Patent Office of a special distinguishing mark used by Abbott Laboratories, Inc., North Chicago, Ill., for its radioactive pharmaceuticals for diagnostic and therapeutic use.

BUSINESS NEWS...in the nuclear field...

Nuclear Power For Ship Propulsion to be Studied:- Newport News Shipbuilding & Drydock Co., Newport News, Va., have now received a contract from the USAEC for a special study of the application of nuclear power to the propulsion of ships. The company developed experience in the nuclear field as a sub-contractor on the USAEC Bureau of Ships (USN) project which was concerned with development of a nuclear reactor suitable for an aircraft carrier. (This aircraft carrier project was terminated following realignment of the USAEC's nuclear reactor power program.) All costs of this study will be borne by Newport News Shipbuilding. Its contract will run for one year, after which a complete report of findings and recommendations will be submitted to the USAEC. Of interest is a clause in this contract which states that title to inventions and discoveries and disposition of reports made in the course of the study will be determined by the USAEC. After satisfactory clearances are obtained, a limited additional number of the company's people will be enabled to investigate pertinent phases of the USAEC's nuclear power program.

Additional Electrical Capacity Available for Uranium-235 Producer Plants:- The third generating plant at Tennessee Valley Authority's Shawnee Steam Plant, on the Ohio River, near Paducah, Ky., is now in commercial operation. The plant, which will have 10-units when completed, is being built to supply electricity to the new uranium-235 producer plants in the vicinity. Each of these three units now operating has a rated capacity of 135,000-kilowatts, and a capability of 150,000-kilowatts. All ten of Shawnee's units are expected to be operating in 1955. (With this third Shawnee unit operating, the total TVA system capacity rose to 5,292,985-kilowatts, of which 1,971,550-kilowatts are in steam, and 3,321,435-kilowatts are in hydro plants.) (Already in operation is the first $500 million unit of the USAEC's new Paducah, Ky., plant for which TVA is furnishing electrical capacity. Construction of the plant began in 1951; it is operated by a division of Union Carbide under a prime USAEC contract.)

Sphere for Prototype Nuclear Power Plant for Submarines Completed:- The large steel sphere at Knolls Atomic Power Laboratory, W. Milton, N.Y., where a prototype nuclear power plant for submarines will be test-operated, has now been completed. The closing of the last openings in the sphere--at top and bottom--marked the end of a ten month's job by Chicago Bridge & Iron Co. (Prime contract for operation of Knolls, and for construction of the submarine nuclear reactor prototype, is held by General Electric Co.) This steel sphere is a structure weighing some 3850-tons, made up of 682-steel plates. Two welds skirting its "equator" are each 706-feet in length, while the diameter of the sphere is 225-feet. Chicago Bridge & Iron said that the largest previously-built structure of its kind are five fuel storage tanks in Connecticut which are 76½-feet in diameter. Purpose of this housing is to provide insurance against the escape of radioactive material in the (remote) event that safety devices were to fail simultaneously. The nuclear reactor is being built here at Knolls Atomic Power Laboratory, by General Electric people. It will be installed in a land-based submarine hull section; water will surround part of this hull, inside the sphere, to simulate actual sea-going conditions. As a time saving measure, the hull has been under construction along side the sphere. This hull job is being done by General Dynamics Corp.'s Electric Boat Division, to specifications approved by the Bureau of Ships (USN). When it is completed, it will be skidded into the sphere through a large hole which will be cut, and then replaced, when the hull is inside. (The particular nuclear reactor to be tested here is the submarine intermediate reactor -- SIR -- which will be the first to use neutrons in the intermediate energy range. Liquid sodium metal will be the heat exchange medium; steam produced will be utilized in turbines for propeller shaft propulsion. After "SIR" has been tested, a second and similar reactor will be built by Knolls for installation in the sea-going submarine "Sea Wolf", now under construction by General Dynamics at its Groton yards.)

Sincerely,

The Staff
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